Text-to-Speech As An Assistive Technology Tool

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Advanced Technology in Education

EDU 590

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September 14, 2014

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Assistive technologies are important for students to be successful in the classroom as well as in their daily lives. As society continues to progress in the age of technology we are learning that there are so many ways to support students with disabilities as well as students that are struggling and have barriers to learning that are not considered disabilities. Examples of these students are those diagnosed with ADHD, students considered struggling readers, and second language learners. Assistive technology is “the tools and strategies that act to liberate the use of technology for all students as well as to provide new ways to “assist” interactions and learning.” (Balajthy, 2005) In this research paper, the assistive technology Text-to-Speech will be discussed. The technology in particular that will be discussed is Read&Write. We will also discuss the characteristics of students who would use Read&Write to support their learning. Lastly, we will discuss the implications of using this technology and the costs.

**Text-to- Speech Technologies**

Text-to-Speech technology converts written text into speech. The technology is designed to support readers that have trouble with reading. Text-to Speech technology may be referred to as electronic readers, assistive reading software, reading machines, screen readers, and computer text readers to name a few. The speech can be a synthesized voice or a natural human voice. The text can be in a word processor, web text or even text in an electronic book. (Balajthy, 2005) The technology reads text in a variety of file types. Examples include text files (.txt), rich text format (.rtf), word documents (.doc), portable document format (.pdf), DAISY, and web files (.html). Daisy files are files that are created for Braille and other formats where users cannot read traditionally printed text. Text-to Speech technologies analyze the text and highlights text while synthesized voices reads the text aloud. This allows the reader/viewer to make a connection between the written text and spoken text. Users have the ability to customize the voices they hear as well as the highlighting of the text they see. To personalize the technology users should be able to choose between a male and female voice and change the color of the text being highlighted.

Elkind & Elkind (2007) classified this technology in three categories: single function, multifunction, and comprehensive. The single function technology is relatively inexpensive. These technologies are limited to simply reading documents. They read documents and web pages. These single function technologies are usually easy to use because all they do is read. Multifunction technologies are moderately expensive in cost. In addition to reading they also have writing and study skill features. The last category is comprehensive technology. These technologies are expensive. They include high quality reading, writing and study skill support tools. They have high quality synthesized voices as well as natural voice sounds. They also include scanning capabilities. The comprehensive technology supports comprehension and reading of users.

When searching for the best technology to support students it is important to consider the cost of the technology to maintain alignment with budgets but is also important to consider the voice quality of the technology. The voice should be clear and the ability to adjust sound based on dialect is important. The success of student reading and comprehension depends on the clarity and enunciation of words used by the synthesized voice they hear. The voice option is also important for students. Allowing the student the ability to change the voice between a male voice and a female voice allows a sense of choice and preference is learning as well as adding humanity in the voice. In addition this can also add to the comprehension of the reading when it is heard in the voice of the gender of the voice the text is written in.

**Read &Write**

After reviewing several tools the Read&Write tool by Texthelp was selected. Read&Write is available in Desktop, Google and iPad formats (Texthelp, 2014). Based on Elkind & Eliknd’s (2007) categories Read&Write is a comprehensive tool. It offers extensive reading, writing, and study tools. It is also an embedded service because it can be used in any application on the computer or mobile device. The specific study tools it offers are citation tools, dictionaries, and highlighting tools. The writing tools offered are speech-to-text, spell checking, and word prediction while writing. Read&Write offers scanning capabilities as well.

Read&Write Desktop offers software in both PC and Mac formats for users. A customizable floating toolbar can be used in all applications where text is to be read and analyzed. The specific applications that it works well with are Microsoft Word, Google Docs, PDFs, Safari, Internet Explorer, Firefox, and Chrome browsers. There are a few more features that are available in the PC version than in the Mac version. Specifically, the Mac version does not offer the pronunciation tutor, speech input, voice note, word cloud, and word wizard features. While the PC version does not offer text help voices. When considering the stand alone desktop version the availability of specific features should be thoroughly compared and investigated based on student needs.

Read&Write for Google offers support to users on PC, Mac and Chromebooks. This software integrates with the web and Google Drive. The specific files it works with are Google Docs, PDFs, Web pages and kesi files. Kesi files are files that are from the Kurzweil system. Read&Write for Google is a Chrome extension that can be added to the Chrome browser for use. All of the same features in the desktop version are offered in the extension. This makes the product accessible to more students as schools opt for chromebooks in the age of 1:1 technology.

iRead&Write is designed for the iPad. The app is not as robust as the desktop and Google versions. The tools are limited but are still available to users. The focus is reading and writing with accuracy. There is an additional tool for readers called Reading Champion. The app is designed to support students in their learning by motivating them as they read. iRead&Write and Reading Champion can be downloaded through the Apple App Store.

**Text-to-Speech Student Characteristics**

Certainly all students can benefit from assistive technology in their learning. However, students that “read slow, reread passages, struggle to decode unfamiliar words, take frequent breaks to recover from stress and tiredness during reading, and take longer than others to read” are strong candidates for text-to-speech technology (Elkind & Elkind, 2007). These students would be classified as struggling readers. Students with learning disabilities such as dyslexia and those that requires texts and assessment to be read to them would benefit as well (Balajthy, 2005). Students that suffer from ADHD would benefit as well since they would need to focus on the task of listening to the text as well as the highlighted text on the screen. Students with vision impairments whether permanent or temporary can benefit from text-to-speech software. Lastly, second language students would benefit as they need to hear good vocalization of the sound of the text in the second language (Bell & Peters, 2007).

**Text-to-Speech Technology Issues**

With every technology there are limitations and issues that must be considered. Converting certain texts to digital text will require scanning that can be time consuming and labor intensive. This is especially true when texts are large such as a textbook or novel. The second issue is usage. For text-to-speech to be a successful tool for students, it must be used consistently as a part of the curriculum for success. Students need consistent interaction with the technology for them be successful using the tool and thus the tool allowing them to be successful in their reading and writing. The third issue is researching online with the tool. Keeping in mind that it is a screen reader, it does not have the ability to analyze results and provide students with what they need. A reader who does not need this tool will enter a search query online and skim the results returned to them. After skimming the results they will select links related to their search and begin investigating information. Students using this tool will need help. The tool will simply read results including urls. This can be overwhelming and confusing. They will need help. In addition, Educators will need to continue supplying students with scaffolding support prior to reading. Support such as background information, key questions and vocabulary (Balajthy, 2005). Lastly, the synthesized voice may read incorrectly. Words, phrases, acronyms, numbers and non-alphanumeric characters can be mispronounced providing students with the incorrect pronunciations of text. (Bell & Peters, 2007)

Cost is a major issue with any technology. The cost the desktop version of Read &Write $640 per user for a single license and $740 with a software maintenance plan. If a user has an IEP or 504 the price is $295 per user. A single license is one PC or Mac. Read&Write for Google has a 30-day free trial that is offered and then individuals must pay $100 per to maintain premium features. For iRead&Write the cost is $19.99 and Reading Champion is $5.99 for the iPad. No matter the choice the price can add up for this product when a district has multiple users. However, investigating actual usage and the system the software will be used on can determine the best cost effective distribution of the software to students.

**Conclusion**

Using software like Read&Write will make “reading less stressful, less tiring, and more sustainable for longer periods of time” for readers. (Elkind &Elkind, 2007) After reviewing this software option the recommended selection would be Read&Write for Google. This recommendation would be used in addition to what is currently being used. Students are able to use the comprehensive product across devices. They also will be able to use it hassle free at home as well as in school. In an age where schools have become BYOD buildings this is ideal and cost effective. This is also ideal for schools that are 1:1 with chromebooks, tablets, and laptops. Although there are many 1:1 schools with iPads it is still effective as well. Schools that have bought into the Google education suite can also benefit, as this is simply an addition to using the blended learning tools they already use for students. In conclusion, the Read&Write tool would be ideal for any school scenario with options for the unlimited budget and the budget conscious.

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